

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

IRRIGATION PIT OR REGULATING RESERVOIR

(No.)  
CODE 552B



**DEFINITION**

A small storage reservoir or pit constructed to regulate or store a supply of water for irrigation.

**PURPOSE**

This practice may be applied as a part of a resource management system to support one or more of the following purposes:

- Provide for regulating fluctuating flows in streams or canals.
- Provide suitable (usually larger) irrigation streams.
- Provide for improved management of irrigation water.
- Provide for timely scheduling of irrigation.
- Provide storage for reuse of irrigation tailwater and rainfall runoff.
- Provide for water quality improvement.

**CONDITIONS WHERE PRACTICE APPLIES**

This standard applies to reservoirs created by impounding structures and pits excavated below the ground surface for the short-period storage of either diverted surface water, water from pumped or flowing wells, or water from an irrigation delivery system.

Regulating reservoirs created by earth embankments shall be within the scope of the standard NRCS conservation practice standard for Ponds, Code 378 if the depth of water above the ground surface, as measured at the spillway crest elevation, does exceed 3 feet.

This standard also applies to concrete and steel regulating reservoirs used to collect water from two or more small irrigation wells for application with a sprinkler or drip irrigation system.

This standard establishes the minimum acceptable quality level for the planning and functional design of irrigation regulating reservoirs. It does not include detailed design criteria or construction specifications for individual reservoirs or components of the regulating facility.

This practice applies only to sites meeting the following criteria and conditions:

1. The existing available irrigation source is of such size that regulation is necessary to accomplish the intended purposes. For small irrigation wells, collection facilities are needed for efficient operation of the pumping plants.
2. Water must be stored to be used between times of rotation deliveries.
3. An adequate and dependable volume of good quality water is or can be made available.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

4. If surface runoff enters the reservoir, the contributing drainage area is or can be protected against erosion so that sedimentation does not shorten the planned life of the reservoir.
5. The irrigation system shall have the necessary components in place to collect and reuse runoff and seepage water.

## CRITERIA

### General Criteria Applicable To All Purposes

All planned work shall comply with Federal, State, and local laws and regulations. Plans to utilize water resources may need to be approved or permitted by the appropriate Water Management District in accordance with Chapter 40-2 Florida Administrative Code (F.A.C.).

**Capacity.** Irrigation regulating reservoirs shall have a usable capacity sufficient to permit the existing irrigation stream to be regulated so that irrigation water can be applied with a reasonably high efficiency. In computing capacity requirements, due consideration shall be given, where applicable, to diverted inflow, surface runoff, precipitation, evaporation, and seepage. Excessive seepage losses shall be prevented by the use of an adapted method of sealing or lining. Additional capacity shall be provided, as necessary, for sediment storage.

Capacity requirements for regulating reservoirs used as part of a system for collecting water from two or more small wells shall be based on the discharge capacities of the contributing wells and on the operation frequency of the sprinkler system.

**Reservoir design.** Irrigation regulating reservoirs created by earthen dams, enclosed embankments, excavated pits, and the related appurtenant structures shall be designed according to NRCS conservation practice standard Pond, Code 378.

Concrete and steel regulating reservoirs shall be designed to meet all loads associated with the structure.

**Inlet protection.** If the inflow enters the reservoir, the side slope of the reservoir shall be protected against erosion by the use of a pipe inlet or some other suitable structure. The capacity of the inlet structure shall be no less

than that required accommodating the maximum anticipated rate of inflow.

**Location.** Structure shall be located where topographic, geologic, and soil conditions are suitable for the practical construction of a regulating reservoir having an adequate storage capacity. Unless the facility is located in a high water table soil, pervious soils in the reservoir area shall be sealed in conformance with NRCS conservation practice standard for Pond Sealing or Lining, Code 521 so that seepage losses are not excessive.

**Overflow protection.** An overflow protection structure having a capacity equal to or greater than the inlet stream shall be provided for an enclosed embankment. This structure may be designed and installed in combination with the outlet works.

**Outlet facilities.** Outlet works shall be provided for the controlled release of irrigation water. The outlet works may consist of a gated conduit through or over the embankment for gravity flow to the irrigated area or to a pumping plant. They may also consist of a pumping plant designed to lift water directly from the reservoir basin.

The capacity of the outlet works shall be no less than that required to provide the outflow rate needed to meet peak period irrigation system demands.

### Additional Criteria to Provide for Water Quality Improvement

The capacity shall be sufficient to collect a minimum 0.5 inch of runoff from the drainage area. This should be sufficient to collect the majority of the runoff "first flush" of pollutants.

## CONSIDERATIONS

Collection of runoff and irrigation tailwater will affect the water budget, especially volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation and ground water recharge.

Surface water quality may be affected by changes in the movement of sediment, soluble chemicals, and sediment attached substances carried by runoff or ground water quality through the movement of dissolved substances below the root zone.

Collection of runoff may affect downstream flows or aquifers and the amount of water available for

other water uses. Effects on the volume of downstream flow may have undesirable environmental, social or economic effects.

Consideration should be given to monitoring of irrigation reuse water for weed seed, harmful bacteria, salinity, and disease. Steps may need to be taken to prevent spreading of these problems.

Consider the effects that this practice may have on wetlands, water related wildlife habitats, riparian areas, cultural resources, and recreation opportunities.

The affect this practice has on the visual quality of onsite and downstream water resources should be considered.

Roof runoff from buildings may be diverted away or into the regulating reservoir. If the volume of water available is a concern, water can be routed into the facility. If facility size is a concern, roof runoff can be diverted away from the reservoir since it will not be a water quality concern.

Consideration should be given to adding additional storage to account for sedimentation in regulating reservoirs that divert and collect surface runoff. It may be desirable to have a sediment control structure to limit sedimentation within the regulating reservoir.

### **PLANS AND SPECIFICATIONS**

Plans and specifications for irrigation regulating reservoirs shall be in keeping with this standard and shall describe the requirements for properly installing the practice to achieve its intended purpose.

### **OPERATION AND MAINTENANCE**

An operation and maintenance plan will be made for each structure site and given to the landuser. All irrigation pits or regulating reservoirs must be adequately maintained if their purposes are to be realized through the expected life. Special considerations shall be given for maintenance needs during the planning, design, and construction of the irrigation pit or regulating reservoir.

The irrigation pit or regulating reservoir should be inspected periodically and especially after heavy rains to determine whether it is functioning properly or if repairs are needed.

Appurtenances such as trashracks, outlet structures, and valves shall be kept free of trash and replaced when needed.

Rills on the slopes of the structure shall be filled with suitable material, compacted, seeded and fertilized as needed. Should the upstream face of the structure erode due to wave action, protection such as riprap may be needed. If seepage through or under the structure occurs, proper corrective measures shall be taken immediately.

Control weeds and woody plants by mowing or spraying. The vegetative cover of the structure shall be maintained by mowing and fertilizing or burning when needed.

### **REFERENCES**

NRCS Conservation Practice Standards  
Ponds, Code 378  
Pond Sealing or Lining, Code 521  
Chapter 40-2 F.A.C.